

REMARKS

This preliminary amendment is being filed with a Request for Continued Examination. Applicants submit that this preliminary amendment provides a full and complete response to the Final Office Action (Final Office Action) dated July 6, 2007 having a shortened statutory period for response set to expire on October 8, 2007.

Claims 1, 20 and 28 have been amended to more clearly recite various aspects of the invention. Applicants believe no new matter has been introduced by the amendments presented herein. The amendments have been made in a good faith effort to advance prosecution on the merits and to put the claims in condition for allowance or to put the claims in better condition for an appeal. Claim 16 has been cancelled without prejudice. Applicants reserve the right to subsequently take up prosecution of the claims as originally filed in this application in a continuation, a continuation-in-part and/or a divisional application. Please reconsider the claims pending in the application for reasons discussed below.

Figure 6 is objected to for lacking a PRIOR ART legend in view of "Deepwater Geohazard Analysis Using Prestack Inversion" by de Kok et al., SEG September 2001 Expanded Abstracts ("de Kok"). Figures 7-8 are objected to for lacking a PRIOR ART legend in view of Prestack Waveform Inversion Using A Genetic Algorithm – The Present And The Future by S. Mallick, CSEG Recorder (June 2001) ("Mallick 2001"). Applicants respectfully traverse this objection.

Applicants respectfully submit that neither de Kok nor Mallick 2001 is a proper 102 reference. "For 35 U.S.C. 102(a) to apply, the reference must have a publication date earlier in time than the effective filing date of the application, and must not be applicant's own work." MPEP 706.02(a)(II)(C). Further, where Applicant is the author of a reference and the reference was published less than one year prior to the date of the filing date of the application, the reference cannot be used against the Applicant since it does not satisfy the 1-year time requirement of 35 USC 102(b). See MPEP 716.10, Example 1.

de Kok is authored by Rob de Kok, Nader Dutta, Mashuir Khan and Subhashis Mallick, all of whom were employed by WesternGeco at the time the reference was

published, which was September 9-14, 2001. Both Nader Dutta and Subhashis Mallick are inventors of the present application. It is clear that Applicants of the present application are authors of de Kok and de Kok was published less than one year prior to the date of the filing date of the application. Accordingly, de Kok is Applicants' own work and cannot be used against the Applicants since it does not satisfy the 1-year time requirement of 35 USC 102(b). See MPEP 706.02(a)(II)(C) and MPEP 716.10, Example 1.

Mallick 2001 is authored by Subhashis Mallick and published on June, 2001. Subhashis Mallick is an inventor of the present application. It is clear that Applicant of the present application is the author of Mallick 2001 and that Mallick 2001 was published less than one year prior to the date of the filing date of the application. Accordingly, Mallick 2001 is Applicants' own work and cannot be used against the Applicants since it does not satisfy the 1-year time requirement of 35 USC 102(b). See MPEP 706.02(a)(II)(C) and MPEP 716.10, Example 1.

Neither de Kok nor Mallick 2001 is prior art to the present application. Applicants respectfully submit therefore that Figures 6-8 do not require the PRIOR ART legend since they do not illustrate prior art. Withdrawal of the objection is respectfully requested.

Claims 1-5 and 7-28 stand rejected under 35 USC 102(a) as being anticipated by de Kok. Applicants respectfully traverse this rejection. MPEP 706.02(a)(II)(C) specifically states that for "35 U.S.C. 102(a) to apply, the reference must have a publication date earlier in time than the effective filing date of the application, and must not be applicant's own work." Further, where Applicant is the author of a reference and the reference was published less than one year prior to the date of the filing date of the application, the reference cannot be used against the Applicant since it does not satisfy the 1-year time requirement of 35 USC 102(b). See MPEP 716.10, Example 1. de Kok is authored by Rob de Kok, Nader Dutta, Mashuir Khan and Subhashis Mallick, all of whom were employed by WesternGeco, the assignee of the present application, at the time the reference was published, which was September 9-14, 2001. Both Nader Dutta and Subhashis Mallick are inventors of the present application. It is clear that Applicants of the present application are authors of de Kok and de Kok was published

less than one year prior to the date of the filing date of the application. Accordingly, de Kok is Applicants' own work and cannot be used against the Applicants since it does not satisfy the 1-year time requirement of 35 USC 102(b). See MPEP 706.02(a)(II)(C) and MPEP 716.10, Example 1. Withdrawal of the rejection is respectfully requested.

Claims 1-5 and 7-28 stand rejected under 35 USC 102(a) as being anticipated by The Petrophysical Basis For Shallow-Water Flow Prediction Using Multicomponent Seismic Data by A. Huffman and J. Castagna (The Leading Edge September 2001) ("H1"). Claims 1 and 28 have been significantly amended to recite "applying a pre-stack full waveform inversion on compressional wave seismic data at a selected control location to provide an elastic model". The underlined portions indicate the added limitations. Support for the amendments may be found throughout the specification, including paragraphs [0013], [0033] and [0053].

Applicants respectfully submit that H1 does not teach or disclose applying a pre-stack full waveform inversion on compressional wave seismic data. In contrast, H1 requires multicomponent data for SWF detection. As further contrast, H1 mentions nothing about applying a pre-stack full waveform inversion. Accordingly, claim 1 is patentable over H1. Claims 2-5 and 7-25 are also patentable over H1 since they depend from claim 1. Withdrawal of the rejection is respectfully requested.

H1 also fails to teach or disclose "processing the seismic data to enhance its stratigraphic resolution" and "performing a stratigraphic analysis on the seismic data" as recited in claim 26. Accordingly, claim 26 is patentable over H1. Claim 27 is also patentable over H1 since it depends from claim 26. Withdrawal of the rejection is respectfully requested.

Claims 1-5 and 7-28 stand rejected under 35 USC 102(e) as being anticipated by US Patent No. 6,694,261 ("H2"). Claims 1 and 28 have been significantly amended to recite "applying a pre-stack full waveform inversion on compressional wave seismic data at a selected control location to provide an elastic model". The underlined portions indicate the added limitations. Support for the amendments may be found throughout the specification, including paragraphs [0013], [0033] and [0053].

Applicants respectfully submit that H2 does not teach or disclose applying a pre-stack full waveform inversion on compressional wave seismic data. In contrast, H2

requires multicomponent data for SWF detection. As further contrast, H2 mentions nothing about applying a pre-stack full waveform inversion. Accordingly, claim 1 is patentable over H2. Claims 2-5 and 7-25 are also patentable over H2 since they depend from claim 1. Withdrawal of the rejection is respectfully requested.

H2 also fails to teach or disclose “processing the seismic data to enhance its stratigraphic resolution” and “performing a stratigraphic analysis on the seismic data” as recited in claim 26. Accordingly, claim 26 is patentable over H2. Claim 27 is also patentable over H2 since it depends from claim 26. Withdrawal of the rejection is respectfully requested.

Claims 1-5 and 7-28 stand rejected under 35 USC 103(a) as being unpatentable over Some Practical Aspects Of Prestack Waveform Inversion Using A Genetic Algorithm: An Example From The East Texas Woodbine Gas Sand by S. Mallick, Geophysics, Vol. 64, No. 2, pages 326-336 (March-April 1999) (“Mallick 1999”) in view of H2.

Claims 1 and 28 have been significantly amended to recite “applying a pre-stack full waveform inversion on compressional wave seismic data at a selected control location to provide an elastic model”. The underlined portions indicate the added limitations. Support for the amendments may be found throughout the specification, including paragraphs [0013], [0033] and [0053].

Neither Mallick 1999 nor H2, alone or in combination, teaches or discloses applying a pre-stack full waveform inversion on compressional wave seismic data at a selected control location to provide an elastic model, as recited in amended claims 1 and 28. Furthermore, there is no “apparent reason to combine the known elements in the fashion” recited in claims 1 and 28. *KSR Int’l v. Teleflex, Inc.*, 127 S. Ct. 1727 (2007). “To facilitate review, this analysis should be made explicit ... Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.* Accordingly, Applicants respectfully submit that claims 1 and 28 are now patentable over Mallick 1999 in view of H2. Claims 2-5 and 7-25 are also patentable over Mallick 1999 in view of H2, since they depend from claim 1. Withdrawal of the rejection is respectfully requested.

Neither Mallick 1999 nor H2, alone or in combination, teaches or discloses processing the seismic data to enhance its stratigraphic resolution” and “performing a stratigraphic analysis on the seismic data” as recited in claim 26. Furthermore, there is no “apparent reason to combine the known elements in the fashion” recited in claim 26. *KSR Int’l v. Teleflex, Inc.*, 127 S. Ct. 1727 (2007). “To facilitate review, this analysis should be made explicit ... Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.* Accordingly, Applicants respectfully submit that claim 26 is patentable over Mallick 1999 in view of H2. Claim 27 is also patentable over Mallick 1999 in view of H2 since it depends from claim 26. Withdrawal of the rejection is respectfully requested.

Claim 6 stands rejected under 35 USC 103(a) as being unpatentable over Mallick 1999 in view of H2 and Kirchhoff Imaging As A Tool For AVO/AVA Analysis by Tygel et al., The Leading Edge (August 1999) (“Tygel”).

Neither Mallick 1999 nor H2 nor Tygel, alone or in combination, teaches or discloses applying a pre-stack full waveform inversion on compressional wave seismic data at a selected control location to provide an elastic model, as recited in amended claim 1. Furthermore, there is no “apparent reason to combine the known elements in the fashion” recited in claim 1. *KSR Int’l v. Teleflex, Inc.*, 127 S. Ct. 1727 (2007). “To facilitate review, this analysis should be made explicit ... Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.* Since claim 6 depends from claim 1 and since neither Mallick 1999 nor H2 nor Tygel, alone or in combination, teaches, discloses or suggests all the limitations of claim 1, claim 6 is therefore also patentable over Mallick 1999, H2 and Tygel. Accordingly, withdrawal of the rejection is respectfully requested.

Claim 6 stands rejected under 35 USC 103(a) as being unpatentable over de Kok in view of Tygel. As mentioned above, MPEP 706.02(a)(II)(C) specifically states that for “35 U.S.C. 102(a) to apply, the reference must have a publication date earlier in time than the effective filing date of the application, and must not be applicant's own work.” Further, where Applicant is the author of a reference and the reference was published

less than one year prior to the date of the filing date of the application, the reference cannot be used against the Applicant since it does not satisfy the 1-year time requirement of 35 USC 102(b). See MPEP 716.10, Example 1. de Kok is authored by Rob de Kok, Nader Dutta, Mashuir Khan and Subhashis Mallick, all of whom were employed by WesternGeco, the assignee of the present application, at the time the reference was published, which was September 9-14, 2001. Both Nader Dutta and Subhashis Mallick are inventors of the present application. It is clear that Applicants of the present application are authors of de Kok and de Kok was published less than one year prior to the date of the filing date of the application. Accordingly, de Kok is Applicants' own work and cannot be used against the Applicants since it does not satisfy the 1-year time requirement of 35 USC 102(b). See MPEP 706.02(a)(II)(C) and MPEP 716.10, Example 1.

Tygel fails to teach or disclose applying a pre-stack full waveform inversion on compressional wave seismic data at a selected control location to provide an elastic model, as recited in amended claim 1. Since claim 6 depends from claim 1 and claim 1 is patentable over Tygel, claim 6 is also patentable over Tygel. Withdrawal of the rejection is respectfully requested.

In conclusion, the references cited by the Examiner, neither alone nor in combination, teach, show, or suggest the claimed invention. Having addressed all issues set out in the office action, Applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,

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